

### **AMENDMENTS TO THE CLAIMS**

#### **Amendments to the claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently amended) A method of processing medical image data using a computer processing system, comprising:

obtaining a first image(s) of a body part in a first plane, wherein the first image(s) generates a first image data volume;

obtaining a second image(s) of the body part in a second plane, wherein the second image(s) generates a second image data volume;

extracting boundary image data of the body part from each of the first and second image data volumes using the computer processing system; and

combining the extracted boundary image data using the computer processing system to form a resultant boundary data volume of the body part.

2. (Cancelled)

3. (Previously Presented) The method according to claim 1, wherein the second image(s) is taken at an angle between about 0 and about 180 degrees from the first image(s).

4. (Previously Presented) The method of claim 1, wherein the first image(s) is taken at a first angle and the second image(s) is taken at a second angle, and further wherein the first angle does not equal the second angle.

5. (Previously Presented) The method of claim 1, wherein the first image(s) is taken at a first time and the second image(s) is taken at a second time.

6. (Previously Presented) The method of claim 3, wherein the second image(s) is taken at an angle between about 0 and about 90 degrees from the first image(s).

7. (Cancelled)

8. (Cancelled)

9. (Currently amended) The method of claim 1, further including:

obtaining at least one additional image of the a body part in a plane different than the other planes, wherein the additional image generates an additional image data volume, wherein boundary image data of the body part is extracted from the additional image data volume using the computer processing system; and wherein the boundary image data from the additional data volume is combined with the boundary image data from the first and second image data volumes using the computer processing system to form a resultant boundary data volume of the body part.

10. (Cancelled)

11. (Currently amended) A method for designing an implant for a body part from image data in a computer processing system, comprising:

obtaining a first image data volume of the body part from a first image(s) in a first plane;

obtaining a second image data volume of the body part from a second image(s) in a second plane;

extracting boundary image data of the body part from each of the first and second image data volumes using the computer processing system;

combining the extracted boundary image data from the first and second image data volumes to form a resultant boundary data volume of the body part using the computer processing system; and

using the resultant boundary data volume of the body part to electronically derive an implant shape.

12. (Currently Amended) The method of claim 11, further including:

obtaining at least one additional image data volume from at least one additional image in a plane different than the first plane and the second plane; and

extracting boundary image data of the body part from the additional image data volume using the computer processing system,

wherein combining the extracted boundary image data includes combining the extracted boundary image data from the first, second and the at least one additional image data volumes to form the resultant boundary data volume of the body part.

13. (Previously presented) The method of claim 11, wherein the resultant image data volume is near-isotropic.

14. (Previously presented) The method of claim 11, wherein the resultant image data volume is isotropic.

15. (Previously Presented) The method of claim 11, wherein the first plane is at an angle relative to the second plane.

16. (Previously Presented) The method of claim 15, wherein the angle is between about 0 and about 180 degrees.

17. (Previously Presented) The method of claim 16, wherein the angle is between about 0 and about 90 degrees.

18. (Currently amended) A method for treating a body part, comprising:

acquiring at least two data volumes from at least two body part images  
performed in two different planes;

extracting boundary image data of the body part from each of the data volumes  
using a computer processing system;

combining the extracted boundary image data from each of the data volumes to  
form a resultant data volume of the body part using the computer processing system;  
and

deriving a therapy for the body part using the resultant data volume.

19. (Cancelled)

20. (Cancelled)

21. (Previously Presented) The method of claim 18, wherein the two scans are performed at ninety degrees relative to one another.

22. (Cancelled)

23. (Cancelled)

24. (Cancelled)

25. (Currently amended) A method of deriving an implant shape by processing image data in a computer processing system, comprising:

obtaining at least one image of a body part in at least a first plane and a second plane, wherein the first plane generates a first image data volume and the second plane generates a second image data volume;

extracting boundary image data of the body part from each of the image data volumes using the computer processing system;

combining the extracted boundary image data from each of the image data volumes to form a resultant image data volume of the body part using the computer processing system, wherein the resultant image data volume is near-isotropic or isotropic; and

using the resultant image data volume to electronically derive an implant shape.

26. (Currently Amended) A method for treating a body part based on image data combined in a computer processing system, comprising:

acquiring at least a first data volume and a second data volume from at least a first body part image and a second body part image, wherein the first body part image is obtained in a first plane and the second body part image is obtained in a second plane and further wherein the first plane is not equal to the second plane;

extracting boundary image data of the body part from each of the data volumes using the computer processing system;

combining the extracted boundary image data using the computer processing system to form a resultant boundary data volume;

deriving electronically the three-dimensional shape of the body part from the resultant boundary data volume; and

selecting a therapy utilizing the three-dimensional shape information.

27. (Cancelled)

28. (Cancelled)

29. (Previously Presented) The method of claim 26, wherein the two scans are performed at ninety degrees relative to one another.

30. (Cancelled)

31. (Cancelled)

32. (Cancelled)

33. (Previously Presented) The method of claim 26, wherein the first data volume is obtained at a first time point  $T_1$  and the second data volume is obtained at a second time point  $T_2$ .

34. (Cancelled)

35. (Cancelled)

36. (Cancelled)

37. (Cancelled)

38. (Currently amended) A method for designing an implant for a body part, comprising:

acquiring at least two data volumes from at least two body part images performed in two different planes;

extracting boundary image data of the body part from each of the data volumes using a computer processing system;

combining the extracted boundary image data from each of the data volumes using the computer processing system to form a resultant data volume of the body part;

deriving electronically the three-dimensional shape of the body part from the resultant data volume; and

deriving electronically an implant shape utilizing the three-dimensional shape information.

39. (Cancelled)

40. (Cancelled)

41. (Previously Presented) The method of claim 38, wherein the two scans are performed at ninety degrees relative to one another.

42. (Currently Amended) The method of claim 1, wherein the resultant boundary image data volume is used to electronically derive an implant shape.

43. (Previously Presented) The method of claim 42, wherein the implant is selected from the group consisting of knee, hip, spine and shoulder implants.

44. (Previously Presented) The method of claim 1, wherein the scans are performed at ninety degrees relative to one another.

45. (Previously Presented) The method of claim 1, further comprising selecting or monitoring a therapy using the resultant boundary data volume.

46. (Currently Amended) The method of claim 1, further comprising electronically deriving the three-dimensional shape of the body part from the resultant boundary data volume; and deriving electronically an implant shape utilizing the three-dimensional shape information.



47. (Previously Presented) The method of claim 1, wherein the first image data volume is obtained at a first time point  $T_1$  and the second image data volume is obtained at a second time point  $T_2$ .

48. (Previously Presented) The method of claim 11, wherein the implant is a knee implant.

49. (Previously Presented) The method of claim 11, wherein the implant is a hip implant.

50. (Previously Presented) The method of claim 11, wherein the implant is a spine implant.

51. (Previously Presented) The method of claim 11, wherein the implant is a shoulder implant.

52. (Currently Amended) A method for selecting an implant for a body part, comprising:

obtaining a first image data volume from a first image(s) in a first plane;

obtaining a second image data volume from a second image(s) in a second plane;

extracting boundary image data of the body part from each of the first and second image data volumes using a computer processing system;

combining the extracted boundary image data from each of the first and second image data volumes using the computer processing system to form a resultant boundary data volume of the body part; and  
using the resultant boundary data volume to select an implant shape.

53. (Currently Amended) The method of claim 52, further including:

obtaining at least one additional image data volume from at least one additional image in a plane different than the first plane and the second plane; and

extracting boundary image data of the body part from the additional image data volume using the computer processing system,

wherein combining the extracted boundary image data includes combining the first, second and the at least one additional image data volumes to form the resultant boundary data volume of the body part.

54. (Previously Presented) The method of claim 52, wherein the resultant image data volume is near-isotropic.

55. (Previously Presented) The method of claim 52, wherein the resultant image data volume is isotropic.

56. (Previously Presented) The method of claim 52, wherein the first plane is at an angle relative to the second plane.

57. (Previously Presented) The method of claim 56, wherein the angle is between about 0 and about 180 degrees.

58. (Previously Presented) The method of claim 56, wherein the angle is between about 0 and about 90 degrees.

59. (Previously Presented) The method of claim 52, wherein the implant is a knee implant.

60. (Previously Presented) The method of claim 52, wherein the implant is a hip implant.

61. (Previously Presented) The method of claim 52, wherein the implant is a spine implant.

62. (Previously Presented) The method of claim 52, wherein the implant is a shoulder implant.

63. (Currently Amended) A method for selecting an implant for a body part, comprising:

- acquiring at least two data volumes from at least two body part images performed in two different planes;

- extracting boundary image data of the body part from the at least two data volumes using the computer processing system;

- combining the extracted boundary image data from the data volumes data volumes using the computer processing system to form a resultant boundary data volume of the body part;

deriving electronically the three-dimensional shape of the body part from the resultant boundary data volume; and

selecting an implant shape utilizing the three-dimensional shape information.

64. (Cancelled)

65. (Previously Presented) The method of claim 63, wherein the two scans are performed at ninety degrees relative to one another.

66. (Previously Presented) The method of claim 63, wherein the implant is selected from the group consisting of knee, hip, spine and shoulder implants.

67. (Currently Amended) A method for designing an implant for a body part, comprising:

obtaining a first image data volume from a first image(s) in a first plane;

obtaining a second image data volume from a second image(s) in a second plane;

extracting boundary image data of the body part from each of the first and second image data volumes using a computer processing system;

combining the extracted boundary image data from the first and second image data volumes using the computer processing system to form a resultant boundary data volume of the body part;

using the resultant boundary data volume to electronically derive an implant shape; and

manufacturing an implant based on the derived implant shape.

68. (Currently Amended) The method of claim 67, further including:

obtaining at least one additional image data volume from at least one additional image in a plane different than the first plane and the second plane; and

extracting boundary image data of the body part from the additional image data volume using the computer processing system,

wherein combining the extracted boundary image data includes combining the extracted boundary image data from the first, second and the at least one additional image data volumes using the computer processing system to form the resultant boundary data volume of the body part.

69. (Previously Presented) The method of claim 67, wherein the first plane is at an angle relative to the second plane.

70. (Previously Presented) The method of claim 69, wherein the angle is between about 0 and about 180 degrees.

71. (Previously Presented) The method of claim 70, wherein the angle is between about 0 and about 90 degrees.

72. (Currently Amended) A method for selecting an implant for a body part, comprising:

obtaining a first image data volume from a first image(s) in a first plane;

obtaining a second image data volume from a second image(s) in a second plane;

extracting boundary image data of the body part from each of the first and second image data volumes using a computer processing system;

combining the extracted boundary image data from the first and second image data volumes using the computer processing system to form a resultant boundary data volume of the body part;

using the resultant boundary data volume to select an implant shape; and  
implanting an implant with the selected implant shape.

73. (Currently Amended) The method of claim 72, further including:

obtaining at least one additional image data volume from at least one additional image in a plane different than the first plane and the second plane; and

extracting boundary image data of the body part from the additional image data volume using the computer processing system,

wherein combining the extracted boundary image data includes combining the extracted boundary image data from the first, second and the at least one additional image data volumes using the computer processing system to form the resultant boundary data volume of the body part.

74. (Previously Presented) The method of claim 72, wherein the first plane is at an angle relative to the second plane.

75. (Previously Presented) The method of claim 74, wherein the angle is between about 0 and about 180 degrees.

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76. (Previously Presented) The method of claim 75, wherein the angle is between about 0 and about 90 degrees.